

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 22

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte HANS-CHRISTIAN DOHT and GUNTHER BIRK

Appeal No. 97-1408
Application No. 08/210,979¹

ON BRIEF

Before HAIRSTON, MARTIN and FLEMING, Administrative Patent Judges.

HAIRSTON, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 1 through 18.

The disclosed invention relates to a method and to a device for controlling the working points of a series-resonant-circuit inverter.

¹ Application for patent filed March 21, 1994.

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Claim 1 is illustrative of the claimed invention, and it reads as follows:

1. A method for controlling the working points of a series-resonant-circuit inverter, comprising the steps of:

(a) determining a phase-angle actual value of a measurable state variable of a load circuit, said state variable having a phase-frequency characteristic which is monotonically decreasing;

(b) setting a value of a phase-angle setpoint in correspondence to said phase-angle actual value;

(c) defining a phase-angle system deviation based on the phase-angle actual value and the phase-angle setpoint; and

(d) setting the frequency of an inverter in correspondence with said defined phase-angle system deviation.

The references relied on by the examiner are:

Schutten et al. (Schutten) 4,951,185 Aug. 21, 1990
Oruganti et al. (Oruganti), "Resonant Power Processors: Part II - Methods of Control," 1984 Industry Applications Society Proceedings, pages 868 through 878.

Claims 1 through 18 stand rejected under 35 U.S.C. § 103 as being unpatentable over Schutten in view of Oruganti.

OPINION

We have carefully considered the entire record before us, and we will reverse the obviousness rejection of claims 1 through 18.

According to the examiner (Answer, pages 3 and 4):

2. Claims 1-18 remain rejected under 35 U.S.C. § 103 as being unpatentable over Schutten et al. (U.S. Patent 4,951,185) in view of Resonant Power Processors: Part II - Methods of Control, by Oruganti et al, 1984 (as cited in PTOL-1449 herein). The Schutten et al. (U.S. Patent 4,951,185) reference discloses the general background of the invention. However, Schutten . . . does not explicitly show controlling a series resonant inverter by linear control signal v. frequency method. Note that Figure 5 of Schutten . . . seems to implicitly suggest the required monotonically decreasing phase to frequency aspect as claimed. Nevertheless, . . . Oruganti . . . show[s] controlling a series resonant inverter by linear control signal v. frequency method. It would have been obvious at the time the invention was made to control a series resonant inverter by linear control signal v. frequency method of . . . Oruganti . . . into the circuit of Schutten . . . (if not already part of Schutten et. al's disclosure), for the well known reason of frequency control of a series resonant converter. See page 869 column 1 at 2.2 et seq. of . . . Oruganti

In response to appellants' arguments in the brief, the examiner listed (Answer, pages 4 and 5) claim phrases in bold-faced type followed by equivalents allegedly disclosed by Schutten as follows:

Table of equivalents

phase angle actual value -- (resonant capacitor voltage, resonant inductor current, voltage applied

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to the resonant tank circuit, and output load voltage, see Schutten et al., column 5, lines 1-11)

measurable state variable --- (specific state trajectory, line 58 of Schutten et al)

phase-frequency characteristic which is monotonically decreasing: --- (see, e.g., figure 5 of Schutten et al.)

phase-angle setpoint value --- "desired state trajectory" as set forth in Schutten et al at column 4 lines 58-60.

phase-angle system deviation --- deviation from the desired value (phase-angle setpoint) this deviation (phase-angle system deviation) creates a new setpoint (Schutten et al. column 5 lines 46-50).

Appellants' response (Reply Brief, pages 1 through 3) to the examiner's contentions is reproduced in toto as follows:

In the Answer, the Examiner sets forth, for the first time, a list of alleged equivalents between the claimed invention and the disclosure of the references upon which the Examiner relies.

Among other equivalents, the Examiner contends that the "measurable state variable" recited in independent claim 1 corresponds to the "specific state trajectory" discussed at column 4, lines 57-58 of the Schutten patent. This is simply not the case. The specific state trajectory discussed in Schutten relates to optimal trajectory control, a technique that is fundamentally different than that of the phase-control method of the claimed invention. As discussed in the Schutten patent, optimal trajectory control, which is used in the Schutten device over an operable frequency range

(OF), is based on optimal control theory and state plane analysis. (Schutten, col. 4, lines 48-60.) The method of the claimed invention has nothing to do with optimal control theory and state plane analysis.

The Examiner further argues that the "phase-angle system deviation" recited in claim 1 is used to create a new setpoint as discussed in Schutten at col. 5, lines 46-50. Once again, the cited excerpt of Schutten relates to the optimal trajectory control method, which is unrelated to the method of the claimed invention. In the claimed invention, the recited "phase-angle system deviation" is not used to create a new setpoint value (**M**^{*}). The setpoint value is set by a higher-order control and is not a function of the phase-angle system deviation (**M**_e). In fact, if anything, the phase-angle system deviation in the claimed invention is a function of the setpoint value and not the reverse, as the Examiner implies.

Likewise, for the above-stated reasons, the Examiner's contention that the recited "phase-angle setpoint value" corresponds to the "desired state trajectory", discussed in Schutten at column 4, lines 58-60, is misguided.

Furthermore, the Examiner's contention that the "monotonically decreasing. . . phase-frequency characteristic" of the recited "measurable state variable" corresponds to the graph of Figure 5 of Schutten is also errant. While it is true that Fig. 5 of Schutten shows a monotonically decreasing relationship between two quantities, that is all it has in common with the recited monotonically decreasing phase-frequency characteristic. The relationship graphed in Fig. 5 of Schutten is simply not a phase-frequency characteristic. Rather, Fig. 5 of Schutten shows the relationship between the **amplitude** of a fundamental harmonic component of a

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rectangular wave signal phase modulated by a series resonant circuit and the **phase modulation angle**.
(See col. 6, lines 25-54.) Both quantities are irrelevant to the claimed invention and the graph of their relationship suggests nothing about using a state variable having a monotonically decreasing **phase-frequency** characteristic, as in the claimed invention.

For the above-stated reasons . . . ,
Appellant[s] respectfully asserts [sic, assert] that the claimed invention is new and non-obvious in light of the references of record

We agree. Even if we assume for the sake of argument that it would have been obvious to one of ordinary skill in the art to combine the teachings of the references in the manner suggested by the examiner, the combined teachings of the references would still lack all of the claimed method steps and all of the claimed device elements. Thus, the obviousness rejection of claims 1 through 18 is reversed.

The decision of the examiner rejecting claims 1 through 18 under 35 U.S.C. § 103 is reversed.

REVERSED

KENNETH W. HAIRSTON)
Administrative Patent Judge)
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JOHN C. MARTIN
Administrative Patent Judge

MICHAEL R. FLEMING
Administrative Patent Judge

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Serial No. 08/210,979

Judge HAIRTON

Judge MARTIN

Judge FLEMING

Received: 02 Dec 98

Typed: 02 Dec 98

DECISION: REVERSED

Send Reference(s): Yes No
or Translation(s)

Panel Change: Yes No

3-Person Conf. Yes No

Remanded: Yes No

Brief or Heard

Group Art Unit: 2838

Index Sheet-2901 Rejection(s): _____

Acts 2: _____

Palm: _____

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Updated Monthly Disk (FOIA): _____

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